

APPENDIX

Process the transmitted and received audio waveforms:

- (a) normalize the transmitted and received audio waveforms so that they contain only positive data
- (b) superimpose/align the normalized waveforms
- (c) divide the calculated difference data into groups of envelopes, set the envelope width to 25% of the audio CODEC buffer size (an audio packet would be four consecutive envelopes)
- (e) summarize the enveloped data and determine the data losses and loss rate

Shift, alternatively, the transmitted (or received) audio data as follows until the lowest point vertex is determined

```
WHERE      start_Shift=1
           range_Shift=4 (to acquire a minimum of five
                        empirical values including the initial
                        data loss value, 0th shift group)
           shiftGroupSize=defined for CODEC being used
```

WHILE NO Vertex

For shift=start_Shift to range_Shift

- (a) set shift_Increment_Direction=
 $(\text{shiftSize} + (-\text{shift} * (((-1)^{\text{shift}})))$
- (b) set shiftSize=shift_Increment_Direction *
shiftGroupSize
- (c) shift waveform by shiftSize
- (d) obtain difference by subtracting the
transmitted waveform from the received waveform
- (e) divide the calculated difference data into
groups of envelopes, set the envelope width to
25% of the audio CODEC buffer size (an audio
packet would be four consecutive envelopes)
- (f) summarize the enveloped data and determine the
data losses and loss rate
- (g) store data loss rate in array

Analyze the collected data loss rate data from the array to find the lowest vertex point

If no vertex is identified, then

- (a) change the start_Shift and range_Shift for two
additional shifts and loss calculation data
points:

```
start_Shift=range_Shift+1
```

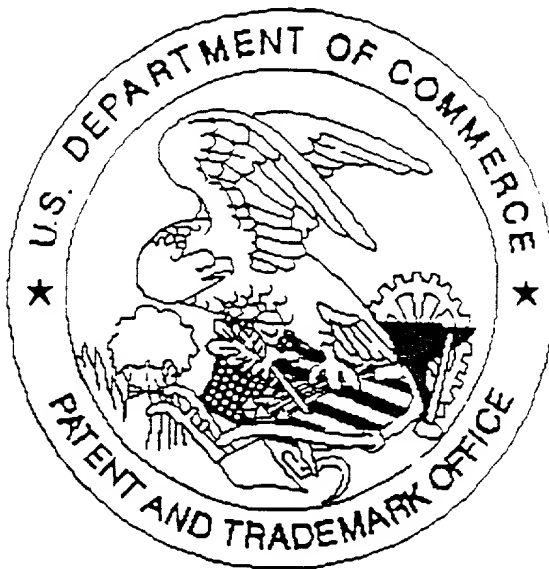
```
                                range_Shift=range_Shift+2
Else
    Found Vertex - Conclude shifting process
End if
5    End While Loop
```

Extract the optimum data loss and associated frequency for
final result

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